

## CLAIMS

**Claim 1:** A system to cause solidification at least in part comprising:  
means for directing an airflow across a heated high-voltage structure so disposed as to provide thermionic emission, the ionized airflow being then attracted towards a plurality of elongated charge bars, said items to be at least in part solidified, being interposed between said high-voltage structures and said charge bars.

**Claim 2:** The system in claim 1 wherein said objects are moved into a second position wherein the ionized vapors and fumes emitted therefrom are repelled therefrom by a second charge bar, and attracted to a moving endless band, said band being continuously cleaned for collection of said vapors and fumes adhered thereto.

**Claim 3:** The system in claim 1 wherein the plurality of heated, high-voltage structures are coated with material that facilitates thermionic-emission, alkaline earth oxides being exemplary of said materials.

**Claim 4:** The system in claim 1 wherein electrically charged structures confine and direct said ionized airflow toward the items to be at least in part solidified.

**Claim 5:** The system in claim 1 wherein the high-voltage structures are perforated hollow tubes containing flammable gas under pressure, so disposed as to emit flames to facilitate ion-emission.

**Claim 6:** The system in claim 1 wherein said ionized airflow causes said fumes and vapors being emitted from said items to be at least in part solidified to become ionized, thereby facilitating removal of said fumes and vapors by electrostatic repulsion and attraction ,

**Claim 7:** The system in claim 1 wherein said items to be at least in part solidified are moved to a second position where a second charge bar causes the ionized vapors and fumes emitted therefrom to be repelled away from said items to be at least in part solidified by an electrostatic field and attracted therefrom to a means for collection of said vapors and fumes.

**Claim 8:** The system in claim 1 wherein said items to be at least in part solidified are moved to a plurality positions where the ionized vapors and fumes emitted from said items, are repelled therefrom by an electrostatic field from a second charge bar and attracted to a means for collection of said vapors and fumes, each of said positions being interposed with said heated high voltage structures.

**Claim 9:** The system in claim 1 wherein said ionized vapors and fumes are caused undergo a chemical reaction wherein the molecules in said fumes and vapors react chemically to produce larger, heavier molecules.

**Claim 10:** The system in claim 1 wherein the items to be solidified are inks on the surface of a moving web of paper and

wherein the heated high-voltage structures consist of a plurality of spaced elongated tubes positioned parallel to the plane of said web and having the major axis of said tubes at a right angle to the direction of web travel,

said tubes being coated with a material that facilitates thermionic emission, and opposed charge-bars so disposed that the web is interposed between said tubes and said charge bars,

said tubes being maintained at a sufficiently high temperature and electrical voltage potential so as to create an electrostatic field between said tubes and charge bars, thereby ionizing said airflow,

said ionized airflow impinging upon said web, thereby causing said ink on said web to become solidified and the fumes and vapors emitted from said ink to become ionized.

**Claim 11:** The device in Claim 1 wherein a substantial portion of the airflow from which said fumes and vapors have been electrostatically cleaned are recirculated into the incoming airflow.

**Claim 12:** The system in claim 1 wherein said ionized vapors and fumes are caused undergo a chemical reaction wherein the ionized molecules in said fumes and vapors react chemically to form larger, heavier molecules through the use of catalysts.

**Claim 13:** The system in claim 1 wherein said ionized vapors and fumes are caused undergo a chemical reaction wherein the ionized molecules in said fumes and vapors are separated from said airstream and used to fuel an internal combustion engine.

**Claim 14:** A system for solidifying ink printed on a moving web of paper comprising:

    a structure means for directing an airflow across a plurality of elongated and perforated hollow tubes at a high negative electrical potential,

    said tubes also containing flammable gas under pressure, so disposed as to emit flames along the length of said tubes,

    said tubes thereby becoming sufficiently heated so as to initiate thermionic-emission of ions from said tubes into said airstream, and

    charge bars so disposed that said web is interposed between said charge bars and said tubes,

    said ionized airstream being thereby attracted to the web interposed in the electrostatic field created between said tubes and said charge-bars, thereby causing ionization of said vapors and fumes as they are emitted from said web, and

    means for collecting said ionized fumes and vapors.

**Claim 15:** The system in claim 14 wherein the voltage on the charge tubes is sufficient to cause a corona on the surface of the web, the ultraviolet energy causing the inks and coatings to become solidified.

**Claim 16:** The system in claim 14 wherein the voltage on the charge tubes is sufficient to create an ozone atmosphere at the surface of the web, thereby causing the inks and coatings to become solidified.

Claim 17: A system for solidifying ink printed on a moving web of paper comprising:  
a structure means for directing an airflow across a plurality of a wir at a high  
negative lectrical potential, said wires being coated with a substance known to  
facilitate thermionic-emission, and sufficiently heated so as to initiate thermionic-  
emission of ions from said wires into said airstream, and  
charge bars so disposed that said web is interposed between said charge bars  
and said tubes,  
said ionized airstream being thereby attracted to the web interposed in the  
electrostatic field created between said wires and said charge-bars, thereby causing  
ionization of said vapors and fumes as they are emitted from said web,  
and a second position downstream in the direction of web travel wherein the  
ionized vapors and fumes emitted from the web are repelled therefrom by a second  
charge bar, and attracted to a collection means.